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ABSTRACT

The purpose of this research was to develop, test, and demonstrate a systematic methodology of triangulation. Triangulation is a technique used to establish credibility of data gathered in qualitative ways. Triangulated conclusions are more stable than any of the individual vantage points from which they were triangulated. Using a previous study as an example--an ethnographic study of two elementary schools in Suffolk County, Long Island, New York, by Rosenbaum--the triangulation method is demonstrated in terms of method and findings. It is concluded that triangulation techniques are essential to making the kinds of informed judgments that qualitative researchers are called upon to make. Post-hoc triangulation, as used in this study, is not as effective as when the triangulation design is part of the original plan for research. Appended are 13 references, a table, and first- and second-order scores for the school work environment. (SI)

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A Triangulation Methodology in Research on School Cultures

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Introduction

A major research thrust in administrative studies today is in the area of organizational culture. This is in no small part because of its potential utility in improving administrative practice in this era of reform.

In order for individuals to act effectively in organizations they must first engage in cognitive processes by which the organization makes sense to them. This has been called "sensemaking"[1] and it suggests to school administrators that they examine the ways in which they think about and understand organizational life. One way to do this is to examine the culture of the organization.

The study of organizational culture provides a way for describing individual cognitive perceptions as well as for tapping into the shared social realities, values, and norms that somehow create an organization.[2] Thus, studies of school culture are not only of interest to students of organization but to administrative practitioners as well.

Background

Research on organizational culture is generally conducted using qualitative methods such as observation, semi-structured open-ended interviews, and the analysis of documents. Qualitative investigators, no less than those using other methods, are continually concerned about issues of methodological rigor.

In the case of qualitative research methodology, one concern of the investigator should be the stability of data produced by qualitative procedures. For example, how much confidence can be placed in the observations of a single individual viewing events from a single vantage point? In general, the question becomes, how can the qualitative investigator enhance the credibility of reported findings?

A principal technique for establishing the credibility of data gathered in qualitative ways is structural corroboration. A major technique for establishing structural corroboration of data is triangulation. Triangulation is a technique which exposes a proposition to possibly countervailing facts or assertions or verifying such propositions with data drawn from other sources or developed using different methodologies.[3]

Though triangulation is difficult, it is very much worth the researcher doing because it increases the credibility of the data and the findings by adding to the robustness of the data. As Webb and others point out, "Once a proposition has been confirmed by two or more measurement processes, the uncertainty of its interpretation is greatly reduced. The most persuasive evidence comes through a triangulation of measurement processes. If a proposition can survive the onslaught of a series of imperfect measures . . . confidence should be placed in it."[4]

Purpose of the Research

The purpose of this research was to develop, test, and demonstrate a systematic methodology of triangulation, using readily-available instruments, that students of organizational culture can use to verify and enhance the credibility of data and findings that have been developed through qualitative field methods.

Perspective. There is little question that the frequency and scope of research in administrative studies using qualitative methods is on the increase. To no small degree this is reflected in studies of the internal arrangements of

educational organizations. For example, studies of organizational culture have become a major segment of administrative research in education.

Qualitative studies ordinarily use such methods as ethnography in an attempt to decipher the behavior observed and language heard in schools. Studies of school culture, for example, ordinarily seek to decipher behavior that has been observed and heard in an effort to describe the culture of the organization. A common concern for the rigor of such research is the credibility or trustworthiness of the reported data particularly inasmuch as it is typically the report of a single observer of admittedly limited events. A well-recognized technique for enhancing credibility of qualitative data is triangulation: that is, confirming a proposition by two or more measurement sources.

Triangulation is an easy metaphor to understand: it is drawn directly from simple navigation techniques used to increase the quality of estimates as to one's actual position by taking several different triangular measures of that position. The assumption is that, as the calculation of statistical means is more stable than any individual single score, triangulated conclusions are more stable than any of

the individual vantage points from which they were triangulated.

The processes of triangulation for the qualitative researcher are, however, not easy to invent or implement. Commonly, the qualitative researcher is at a loss to know what sorts of other data may be used to triangulate the propositions that have been developed through the analysis of observation, interview, and document analysis. The purpose of this research was to design and test a triangulation technique that may be readily used by researchers investigating topics relating to the organizational culture and climate of schools.

Research Problem

To begin with, the investigators had available an ethnographic study that had examined the organizational cultures of two elementary schools that had been described as being (a) demographically similar yet had (b) produced remarkably dissimilar results in student performance on standardized tests.[5] Thus, the first data set in the present research was in the form of an ethnographic study of two schools that had already been reported by an investigator who had used (a)

conventional ethnographic field observation methods to gather data and (b) theme analysis techniques to interpret the data. The central finding of this earlier study was that the organizational cultures of the two elementary schools were dissimilar in ways that could be systematically described in such terms as the organizations' differing rituals, heroes, stories, history, values, and behavioral norms. The issue was to triangulate this finding independently so as to check its credibility and trustworthiness.

Research questions.

Q.1. Does analysis of data yielded by administering the Organizational Climate Index in each of the two schools confirm the findings of the qualitative study that had been previously done in those schools?

Q.2. Does analysis of data yielded by administering the Organizational Culture Assessment Inventory (OCAI) in each of the two schools confirm the findings of the qualitative study that had been previously done in those schools?

Methods

To answer these questions the investigators went back into the same two schools in which the ethnography had been done and collected data using two existing paper-and-pencil inventory instruments: the Organizational Climate Inventory (OCI)[6] and the Organizational Culture Assessment Inventory (OCAI).[7] The relevance and appropriateness for using the OCI in studying organizational culture has been described by Owens[8] and similar issues for the OCAI were described by Steinhoff and Owens.[9] Thus two additional data sets relevant to organizational culture were drawn from the schools, creating a total of three data sets. These three views of the same phenomenon were to be compared and contrasted in terms of their apparent consistency.

Background on the Rosenbaum study. Since our research hinged on an earlier ethnographic study by Rosenbaum, we will provide a brief summary of it here.

The Rosenbaum study had been done in two elementary schools in Suffolk County on Long Island of New York that were similar in many ways but in which achievement test scores were quite disparate. To create matched pairs of schools from which to select a sample for study, first, all the elementary schools

in the county were grouped on the basis of certain demographic characteristics. Then, schools having similar demographic profiles were paired, with each dyad consisting of one high-achieving school and one low-achieving school. The achievement levels of the schools were determined by the scores achieved by pupils in reading and mathematics on the New York State Pupil Evaluation Program (PEP) tests. The PEP tests are administered annually to all pupils in the third and sixth grades in the public schools in the State of New York. The upshot of this process made it possible to select what appeared to be the three best-matched dyads of schools in the county and entry to conduct an on-site participant-observation study was undertaken in one of these pairs.

The two schools that were studied had enrollments of 616 and 620 respectively in kindergarten through grade 6. Class sizes in each school ranged from 23 to 25 pupils per class. Each of these suburban schools had a pupil population that is about 97% white and in each school fewer than 10% of the families of the students received public welfare assistance. In-out migration of pupils was less than 10% annually in each school and the teacher populations of both schools were stable. In each school most of the teachers have a master's degree and have taught for more than 15 years.

The Rosenbaum study, which triggered our research, examined two academically dissimilar elementary schools and had yielded rich, fine-grained thick description. Theme analysis of this descriptive data had yielded findings that may be summarized as follows. Each school had an identifiable and describable culture comprised of shared values and beliefs that are discernable in the heros that people recognize in the school, frequently told stories and myths about the school, symbolic leadership by the principal, and cultural norms which shape daily life within the school. Furthermore, the lower-achieving school manifested a culture that was describably different from that of the higher-achieving school.

The culture of the lower-achieving school, which we called School B in the present study, was described by Rosenbaum as focused on maintaining order and control, on standardization of the program in a traditional lecture-based teaching mode, and on self-preservation. The history of the school is rife with conflict, frequent turnover in the principalship, and lack of district support of innovation. The only identifiable "hero" of the school is a teacher union activist, who serves as protector-confidante of the teachers in the school.

The higher-achieving school, which we call School A, was described as focused on meeting the needs of staff and students alike, on creating and maintaining a warm, supportive teaching/learning environment, and on achieving academic success. School A had a history of shared leadership, a partnership between several key teachers and the founding principal who, before her retirement after many years of service, had clearly become a hero in the school. Furthermore, Rosenbaum described this collaborative arrangement between teachers and the relatively new principal as having been carried over into the present new era of leadership. Thus School A was described as rich in cultural heroes, past and present, all of whom were praised by staff members for their warmth, sense of humor, and their pedagogical skills.

Thus, the ethnographic data that Rosenbaum collected and analyzed suggests that the climates of School A and School B are very different and manifest the unique underlying culture of the two schools. The lower-achieving School B had a climate that may be described as neutral, at best, and which was described by many people who worked there as cold and unwelcoming. The higher-achieving School A, on the other hand, had a warm, accepting, positive and productive school climate.

But, the question remains: how credible were those data and the analysis drawn from them? We decided to reenter those

schools and, using questionnaire instruments, gather data independently to see whether they would confirm or challenge Rosenbaum's findings.

Re-entry into the schools. Since our research required questionnaire data from these two specific schools, and not from some general population of schools, it was necessary to re-enter them in much the same manner as an ethnographer would: developing key informants, developing high-trust working relationships, and so on. The senior investigator took responsibility using the following procedure in each school.

First, the principal of each school was called. During that call, the principal was told that (1) the Rosenbaum study had been completed and that we wished to deliver copies of it to the school, (2) the Rosenbaum study had received a national award for its excellence, and (3) we had an interest in following up the study by asking teachers to complete some questionnaires. Then an appointment was made to see the principal for the purpose of delivering the Rosenbaum study and discussing the possibility of doing the follow-up study.

During the conference with each principal that had thus been arranged, a copy of the study was delivered to the principal

and a second copy was delivered to be conveyed to the superintendent of schools. This was accompanied with assurances that we would welcome comments, reactions, and would be delighted to discuss it if there was any interest in doing so. Then the matter was broached of having the teachers fill out two questionnaires.

In each school, the procedure for filling out the Organizational Climate Index was for the principal to distribute packets to the teachers and solicit their cooperation in completing the questionnaires that were enclosed in them. The envelopes thus distributed contained (1) a cover letter from the investigator asking them to fill out the questionnaires, and (2) the questionnaires and post-paid envelopes for returning them directly to the investigator.

The procedure for completing the Organizational Culture Assessment Inventory was different: the investigator requested that the principal arrange a one-hour meeting of teachers with the investigator so that the questionnaire could be completed using focus-group techniques.[10]

Findings

This portion of the triangulation study involved the collection and analysis of responses of teachers in the two

schools to the Organizational Climate Index (OCI). The OCI was developed by Stern and Steinhoff and was itself based on Stern's original application of the theories of H.A. Murray. The OCI measures the perceptions of Environmental Press by organizational participants. A complete description of the history of the OCI and related instruments may be found in Stern's work, People in Context.[11] Research using the OCI in public schools is described in Owens' Organizational Behavior in Education.[12]

To maximize the validity and objectivity of this study, one member of the research team was assigned the task of analyzing the responses of the OCI without having been privy to the information provided in the original ethnography.

OCI profile of School A. The results of the OCI survey are presented in Table 1. OCI first-order and second-order factor definitions are presented in Appendix A. The data arrayed in Table 1 appear to describe a school that is characterized mainly by autonomic forms and structures that dominate the direction of day-to-day activities. The Environmental Press described by the teachers presents a picture of a school climate that is relatively unstimulating and that lacks warmth, direction, and a sense of mission. If one were to

utlize Blake and Mouton's typologies in describing this climate, one might say that it was the result of "impoverished management."

In order to further analyze the data from the teachers in School A, the investigators tabulated the percentage of item responses (true or false) and then edited these high-consensus responses into descriptive paragraphs. The following narrative represents the teachers' view of School A in terms of the items they agreed upon (65% or higher).

In this school teachers find others eager to help them get started. "Lend a helping hand" could very well be the motto of this place and, in fact, people are quick to help each other out. Teachers are easily moved by the misfortune or distress of others. However, service to the community is not rated as a major responsibility of the institution in which they work, and teachers are not expected to help out with fund drives, CARE, or Red Cross.

Good manners, proper social forms, and making a good impression are important in this school, and people are always carefully dressed and neatly groomed. However, those who deviate from this norm are not likely to have this called to their attention.

The day-to-day routine is well organized, and the activities are carefully planned and checked for timeliness and accuracy. However, the work itself does not represent a strong personal challenge for the teacher. People here do not thrive on adversity. Teachers set high standards of achievement for themselves, put a great deal of energy into their work and try out new ideas. However, they report that good work itself is not recognized by the administration.

Administrators are not seen as practical, efficient, helpful or enthusiastic. Administrative policy goals and objectives are unclear. There are favorites in this place, and personality and pull are more important than competencies in getting

ahead. The administrative staff are often joked about or criticized. Time is wasted.

There is a lack of group spirit and teamwork. People do not feel free to express themselves openly. There are few social activities and parties.

Although people spend a great deal of time talking about and describing complex problems, the faculty itself is completely disengaged from most forms of intellectual activity. Improving one's knowledge of important works of art, music, and drama is not encouraged; few people read magazines and books involving history, economy, or political science, and there is little interest in the philosophy and goals of science.

Discussion. The picture presented by the respondents appears to be that of a school whose climate is characterized by isolation and anomie. The faculty itself sees itself as supportive of one another in a personal sense, but there is no evidence of support or teamwork from an organizational perspective. The teachers see themselves as working hard to accomplish their day-to-day tasks within the confines of their self-contained classrooms without much direction or reward from an unresponsive and unsympathetic administration whose energies may be directed to some other unstated view. The lack of active and stimulating intellectual environment unfortunately is not atypical and represents a portrait of school climate that has been verified by other recent studies of elementary schools.

We conclude that triangulation in School A does little to confirm the previously-reported ethnographic analysis and, indeed, raises some interesting questions about the culture in that school that might be useful in sharpening the focus of the ethnography if it were still under way. The lack of response by the teachers in School B was highly predictable in view of the ethnographic observations that Rosenbaum had made in his earlier study there and, thus, it does enhance the credibility of his ethnographic analysis.

Q.2. Does analysis of data yielded by administering the Organizational Culture Assessment Inventory (OCAI) in each of the two schools confirm the findings of the qualitative study that had been previously done in those schools?

The OCAI is an instrument which describes the organizational culture of an organization utilizing six interlocking dimensions: 1) the history of the organization; 2) the values and beliefs of the organization; 3) the myths and stories that explain the organization; 4) the cultural norms of the organization; 5) the traditions, rituals, and ceremonies of the organization; and 6) the heroes and heroines of the organization. The teachers were asked to complete the OCAI, which ultimately provides metaphors which purport to

define the school's culture. These metaphors illustrated the perceptual reality of the respondents and serve as the basis upon which teachers set goals, make commitments, and execute plans.[13]

Neither the school principals nor the faculty cooperated as fully in completing the OCAI as they did the OCI. In keeping with the methodology of the study, however, the investigators sought alternative sources of data. A review of those few completed OCAI questionnaires, coupled with an analysis of metaphorical comments written on the margins of the OCI answer sheets (before the respondents knew there was an additional questionnaire to fill out), and a few informal interviews, provided one interesting and illustrative root metaphor which we believe aptly describes and illuminates the culture of School A. The faculty described their school as a "sinking ship."

We conclude that the fragmentary metaphorical data do little to confirm the previously-reported ethnographic analysis of School A. They do, however, appear to support the data on climate that were obtained using the OCI. On the other hand, the non-response to the OCAI from School B was highly

predictable from the earlier ethnographic analysis and, thus, lends credibility to that analysis.

A qualitative triangulation. Our research plan called for us to conduct triangulation using traditional survey methods, employing a paper-and-pencil questionnaire and a focus-group questionnaire as the basic data-gathering instruments. As we have shown, the people in School A were willing to extend only limited cooperation to the present investigation while those in School B rejected cooperation. Nevertheless, it turned out that the need to re-enter the two schools also offered a serendipitous opportunity to conduct a naturalistic triangulation as well. We found the encounter in each of the two schools remarkably as Rosenbaum's research had described.

Immediately upon arriving in the office of School A the principal emerged from her private office smiling, greeting her visitor warmly, offering coffee. She was pleased to receive a copy the earlier study, professing great interest in it. She avowed that she would read it at once and would also deliver a copy to the superintendent of schools. As to the questionnaires, yes, she would give them to the teachers personally at a meeting to be held the very next day. As to the possibility of a focus group meeting with the teachers,

she would consult the school's "Effective Schools Committee," comprised of teachers, which was scheduled to be held in a few days, for their advice. Withal an encounter that was businesslike, open, friendly, and pleasurable.

The encounter with the principal of School B was markedly different. In the first place, a new person had been appointed as principal of School B: one of a number of principals who - as Rosenbaum had pointed out in his study - had succeeded to the principalship of School B over the course of the last few years. The present principal had been retired from the principalship in another district and had been prevailed upon to "come out of retirement" to take the helm of School B for a year or two, until someone else could be employed.

Upon arrival at the school office the visitor found his way barred by a teacher slouched against the door-frame while gossiping with the school secretary, who was seated at her desk within, as the teachers' pupils stood in the corridor fidgeting and growing noisily impatient to get on with the business of the day. Having sought to get through the doorway, the visitor was required to wait a few moments until the teacher completed her conversation and sauntered past the visitor to once again take charge of her class. Upon entering the office the investigator was impressed with the disorder

of the place: open boxes of books and school supplies were piled around on the counter as well as the floor, papers were seemingly stacked everywhere - atop file cabinets and even on the chairs that a visitor might ordinarily use while waiting for the principal to extricate himself from other business to meet his appointment. The principal was an energetic man who met his visitor sitting behind his desk offering a perfunctory handshake but abjuring such ritual amenities as offering coffee. He had not heard about the Rosenbaum study having been done, and seemed puzzled that anyone would be interested in studying that school. He quickly indicated that his experience as principal of School B had not been especially rewarding, that he was looking forward to returning to retirement once again, and that "It would take me years to get this school in shape. There are a lot of problems here." However the principal avowed that he would read the study, would deliver a copy to the superintendent of schools, and said, "I'll give the questionnaires out and encourage people to respond to them. But about a meeting with teachers, I don't know. Teachers here are not real anxious to attend any more meetings than they have to." He went on to explain that one of the kindergarten teachers was a vice-president of the teachers union and a strong leader in the school; she would have to be consulted about that. The visitor departed wondering if the

process of entry had been started or had merely been shunted aside.

The day following these interviews, the investigator called and made appointments with each principal for a follow-up visit to be made three days after the initial interviews. Once again the principal in School A was warm in her greeting and approachable in her manner. She spoke animatedly about the Rosenbaum study which, it was clear, she had already read carefully. "I'm going to make it available to the teachers," she said, "and, in fact, I'd like to use it as the basis for discussion at a school-wide faculty meeting." She described having given out the questionnaire packets, and described the teachers as being generally receptive to completing them. The Effective School Committee had not yet had it's meeting, so the proposal of having a focus group meeting was still in limbo.

In School B, the principal quickly ushered his visitor into his private office and carefully closed the door. He had apparently read at least some of the Rosenbaum study and had shared it "with one or two teachers." He reported that "at least one teacher" had protested that, although Rosenbaum had assured respondents of anonymity, a knowledgeable insider could still discern who some of the "characters" actually were despite the efforts that had been made to disguise actual

names and places in the report. He went on to add that the kindergarten teacher-cum-union vice president wanted a copy of the Rosenbaum study for her own careful study. The principal ushered his visitor from the office explaining that he had distributed the questionnaires to the teachers and expressing doubt that a focus-interview with teachers could be arranged. The investigator took his leave harboring doubts that much data would be obtainable from School B.

The following day the investigator received a hand-written letter from the kindergarten teacher/union vice-president of School B. In the letter, written on the letterhead of the teachers union, the writer complained that Rosenbaum had promised her a copy of his study, and she had not received it, and went on to vaguely suggest that she found some of his observations and findings a bit offensive and perhaps not well-supported by evidence. The investigator telephoned her at home promptly and offered - much to her surprise - to meet her at a time and place convenient to her. An appointment was arranged for the next day, to be after school in the offices of the teachers union.

At that interview the investigator presented a copy of the Rosenbaum study, which she acknowledged having already read. She revealed that she was a doctoral student at an up-state university who was, herself, preparing to do a naturalistic

study for her dissertation. Much of the interview dealt with her interest in naturalistic methodology; she deftly and persistently turned aside all efforts to discuss the Rosenbaum study itself or our interest in pursuing a follow-up of that study in School B. The investigator left realizing that the staging of the encounter may well have created an impression in the eyes of the hangers-on that one usually finds in the offices of teachers unions that their vice-president had a sit-down with that professor from the University on her own turf, and they could surmise whatever they wished about what had been said.

Discussion

With the increasing popularity of qualitative research methods in education, the need to attend to methodological rigor becomes increasingly more important. This is a matter of particular concern in directing doctoral dissertation research for two reasons: (a) the investigators are neophytes using a method that depends heavily on the judgments of the investigator as to the importance and significance of field data and (2) even today, few doctoral students in education who engage in qualitative research appear to have strong backgrounds in either qualitative research methods themselves

or - perhaps more significantly - the analytic concepts from the social sciences (such as anthropology and sociology) that are essential to making the kinds of informed judgments that qualitative researchers are called upon to make. Thus, it is important to devise triangulation techniques that are easy to use and dependable.

It is clear from the limited response that we got in this study that post-hoc triangulation is perhaps not the strongest strategy. Our experience made clear that in at least the two schools we were dealing with, once the participant observation phase of the research was over, the teachers had little interest in continuing to cooperate. Re-entry was a major problem. Therefore, the next time around we intend to build the triangulation design into and make it part of the original plan for ethnographic research.

We also question the conventional wisdom that organizational culture and organizational climate are as stable over time as the literature generally assumes. Though we do not describe it in this report, both of these schools were undergoing stress and turbulence as a result of extramural events in their school districts that had not existed at the time of the study that we were triangulating. We think, though we cannot

demonstrate it, that our data - as well as our difficulties in re-entering the schools - reflected that fact and the impact that it was having on the organizational climate in the schools.

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TABLE 1

OCI Factor and Area Means

and Standard Scores[a]: School A

		$\bar{X}$	σ	S.S
Factor	1. Intellectual Climate	3.45	2.11	-2.98
	2. Achievement Standards	5.09	2.34	-1.97
	3. Personal Dignity	4.18	3.16	-2.94
	4. Organizational Effectiveness	4.73	2.61	-2.50
	5. Orderliness	4.18	2.40	-1.53
	6. Impulse Control	7.09	2.34	2.68
Area	I. Development	15.64	8.55	-3.39
	II. Task Effectiveness	8.91	4.57	-2.20

[a] $\bar{X} = 0$ $\sigma = 2$

APPENDIX A

First Order Scores - School Work Environments

1. Intellectual Climate

Schools with high scores on this factor have environments that are perceived as being conducive to scholarly interests in the humanities, arts, and sciences. Staff and physical plant are seen to be facilitative of these interests and the general work atmosphere is characterized by intellectual activities and pursuits.

2. Achievement Standards

Environments with high scores on this factor are perceived to stress high standards of personal achievement. Tasks are successfully completed and high levels of motivation and energy are maintained. Recognition is given for work of good quality and quantity and the staff is expected to achieve at the highest levels.

3. Personal Dignity

Organizational climates scoring high on this factor respect the integrity of the individual and provide a supportive environment that would closely aproximate the needs of more dependent teachers. There is a sense of fair play and openness in the working environment.

4. Organizational Effectiveness

Schools with high scores on this factor have work environments that encourage and facilitate the effective performance of tasks. Work programs are planned and well-organized, and people work together effectively to meet organizational objectives.

5. Orderliness

High scores on this factor are indicative of a press for organizational structure and procedural orderliness. Neatness counts and there are pressures to conform to a defined norm of personal appearance and institutional image. There are set procedures and teachers are expected to follow them.

6. Impulse Control

High scores on this factor imply a great deal of constraint and organizational restrictiveness in the work environment. There is little opportunity for personal expression or for any form of impulsive behavior.

Second Order Scores - School Work Environments

Area I - Development

Schools with high scores on Development Press are characterized by organizational environments that are supportive of intellectual and interpersonal forms of activity. The environments

are intellectually stimulating, supportive, set high standards for achievement, and do not inhibit personal expression.

Area II - Task Effectiveness

High scores on Area II are indicative of an organizational environment that emphasizes high levels of orderliness and structure. The environment is work oriented, rather than people oriented.